TRIL – Technology Research for Independent Living

Technology Research for Independent Living

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TRIL Centre Manager

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TRIL Centre

Mission

TRIL's mission is to carry out scientific ageing research that informs person-centred technology development and models of care that **promotes** independent living, by **predicting** health status and **preventing** decline in older people.

Vision

Advances in technology combined with new models of health care will transform the way we live, adding life to years.

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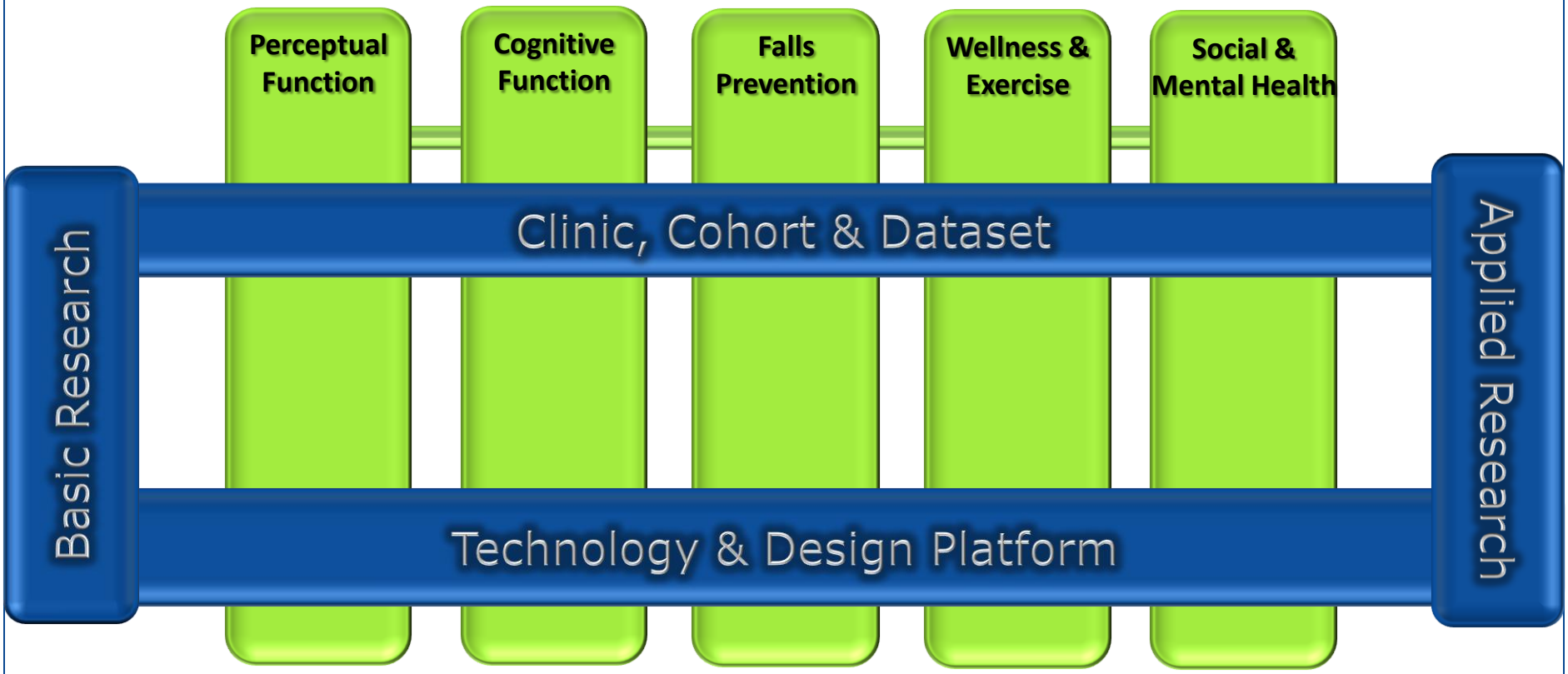

discovery……design……implementation……evaluation

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TRIL Centre - Characteristics

- Applied Approach – taking findings into the home/community
- Industry/Academic collaboration
  - Active Industry engagement – not industry sponsored
  - Good blend of industry, clinical & academic environments
- Clinically informed technology development
- Truly Multidisciplinary – technologists, scientists and clinicians working collectively
- Quantitative & Qualitative

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TRIL Clinic, St. James's Hospital, Dublin

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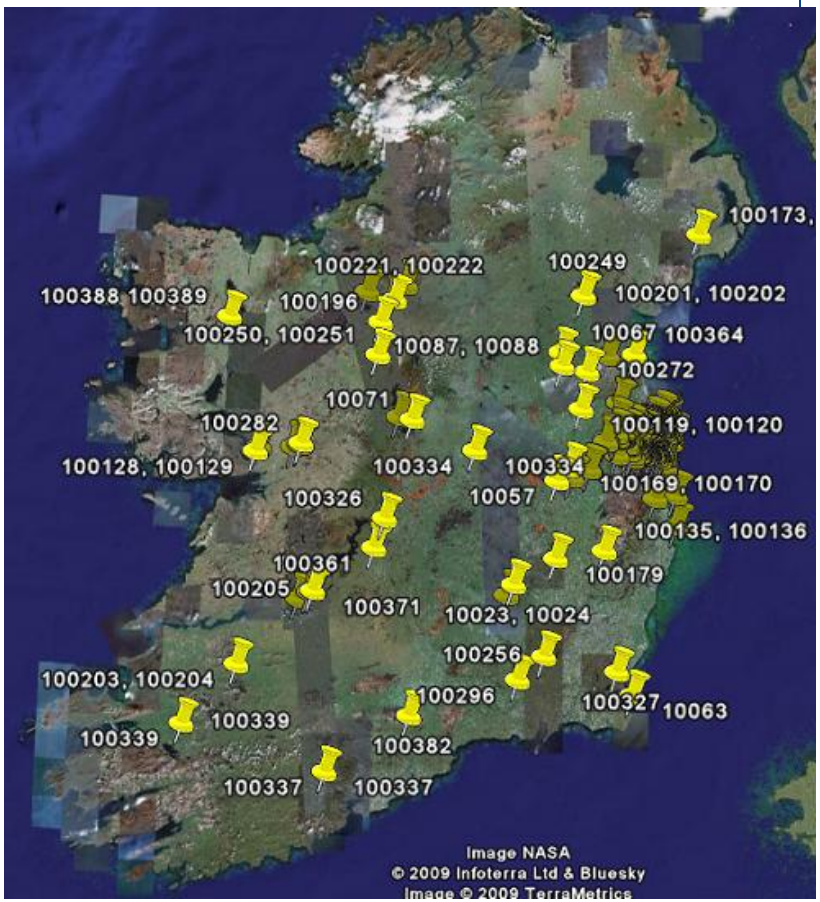
TRIL Participant Cohort (625)



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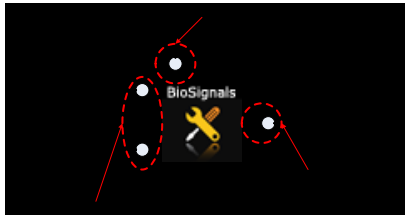
Technology & Design

Technology Research for Independent Living

Technology Building Blocks

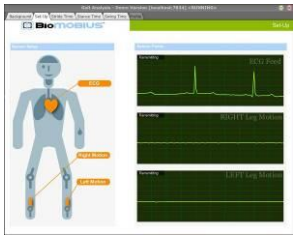
shimmer
DISCOVERY IN MOTION

BioMOBIUS™



User-Centred Design Approach

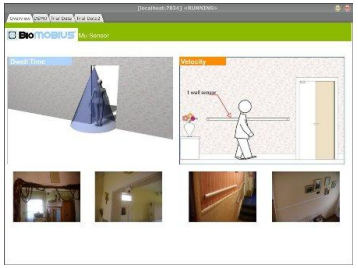
Technology Prototypes

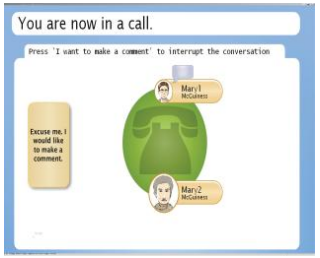


Kinematic, Physiological and Ambient Monitoring

Cognitive Function and Alertness stimulation

Home Evaluation





SOFTWARE ENGINEERING
BIOMEDICAL ENGINEERING
INTERACTION AND INDUSTRIAL DESIGN

ETHNOGRAPHY
INFRASTRUCTURE AND DATABASE MANAGEMENT

HUMAN COMPUTER INTERACTION
FIRMWARE / HARDWARE DESIGN ENGINEERING

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Home Technology Evaluations

Taking research from the Lab to the Home – *Home Deployment Programme*

- Evaluation technologies in a real world environment, focus on:
  - Usability
  - Efficacy
  - Robustness
- Controlled -> Uncontrolled
  - Challenges: Environmental/Ambient, Communications, Co-inhabitants, Pets, etc.
- Active cohort from TRIL Clinic
- Goal to establish a large test-bed infrastructure
  - Hundreds -> Thousands

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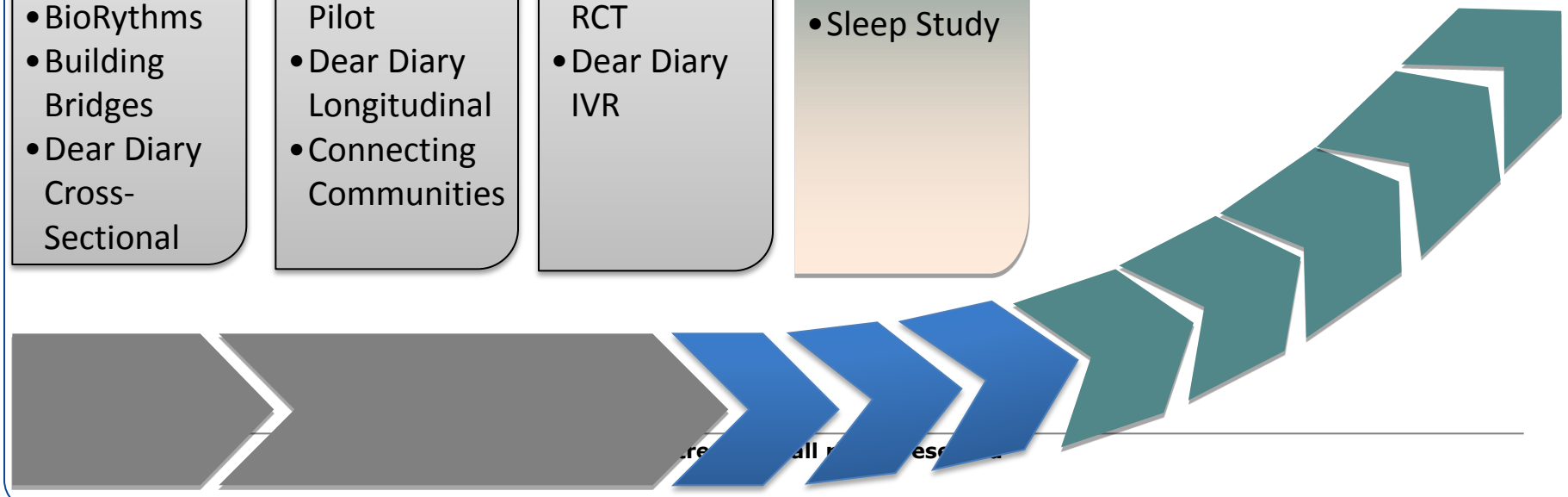
Home Deployment Journey

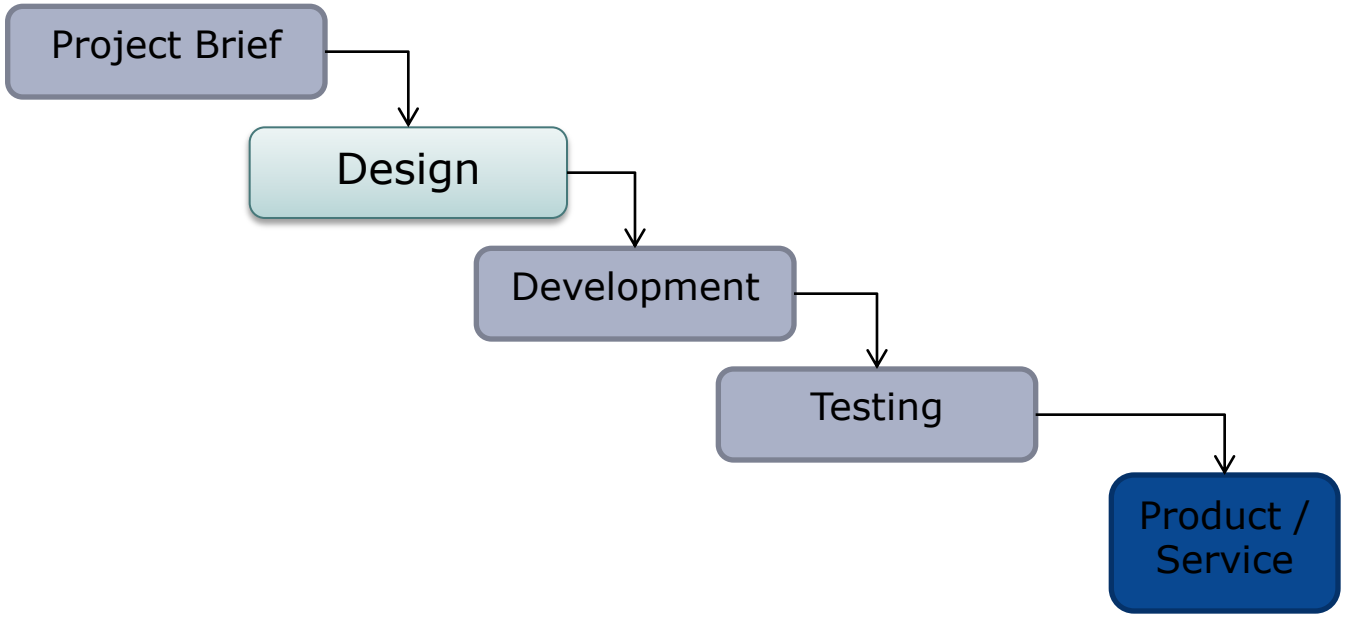
2008	2009	2010	2011
4 Home Trials	**4 Home Trials**	**3 Home Trials**	**5 Home Trials**
133 Homes	**135 Homes**	**140 Homes**	**155 Homes**
• VoiP Trial • MuSensor • Engineering Alertness • BioRythms • Building Bridges • Dear Diary Cross-Sectional	• Balance & Strength • Engineering Alertness Pilot • Dear Diary Longitudinal • Connecting Communities	• Wellness & Exercise • Engineering Alertness RCT • Dear Diary IVR	• TRIL Testbed (3 trials) • Perceptual Function • Sleep Study

- 27 Design Workshops
- 16 Home Trials
- 563 Homes visited
- .5 TB Data Collected



Design Model

Design often fits within a part of a lifecycle..



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Are users needs considered?

- **Traditional Project Brief:** A project brief may come from a marketing or a technical department. It often make assumptions about users.
- **TRIL Project Brief:** TRIL uses ethnographers and designers to explore the project brief, as often 'users' needs will not be considered in the project. By watching and talking to users we can understand how to better create product and services to help them.

- **Design (Traditional):** Design is part of waterfall process and has a distinct phase, all details are highly documented and passed over to the development team.
- **Design (TRIL):** TRIL creates design prototypes that can be quickly iterated early on the project. The design team works along with the development team to enable good user experience thought the agile development process by focusing on good user experience.

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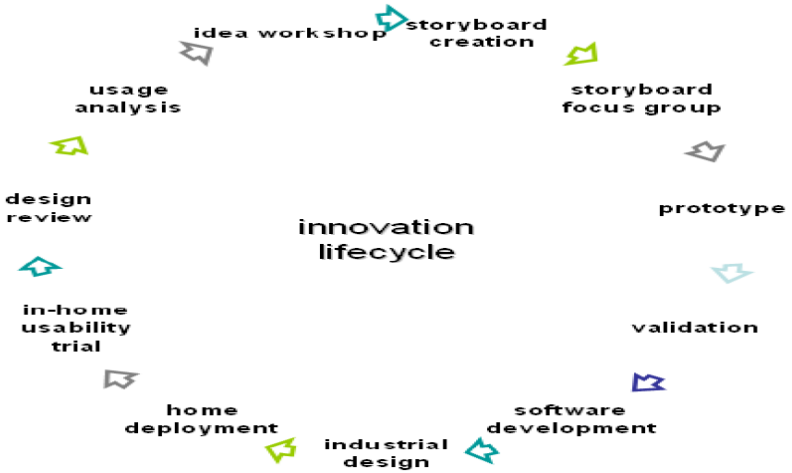
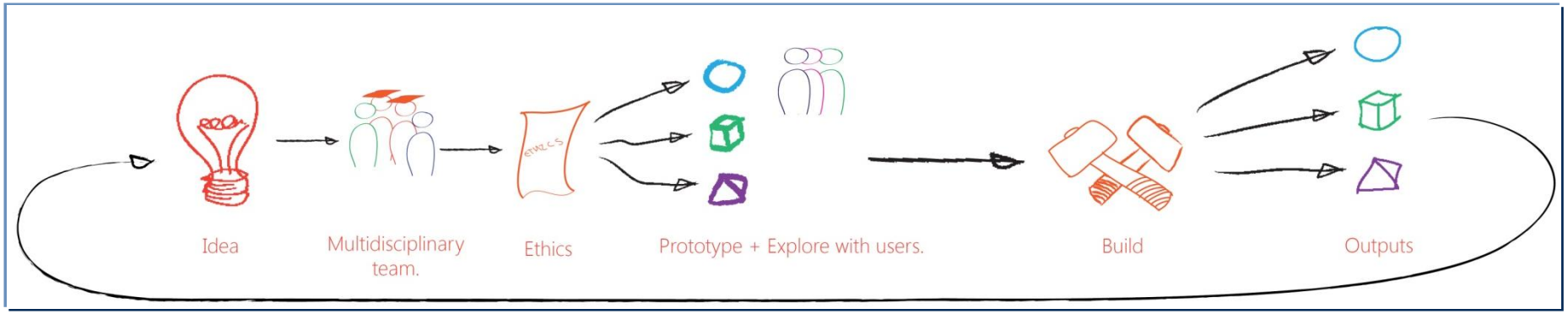
User-Centred Design





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User-Centred Design

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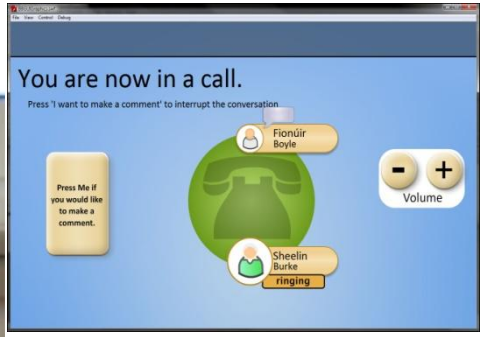
The Building Bridges Project

Goal: Co-design and develop intuitive communication technology for older people to support social connection and reduce risk of loneliness and social isolation



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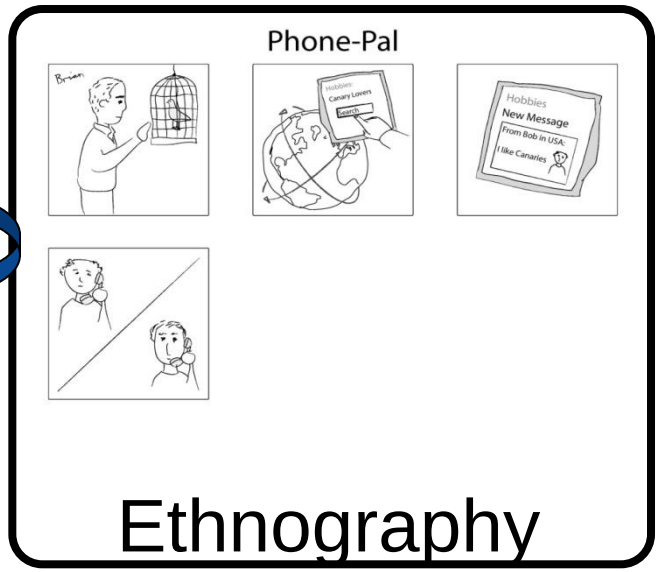
The Building Bridges Project

Design



Ethnography

Phase 1

Understand Problem

- Home Visits
- Expert interviews
- Technology review
- Skype phone pilot

Phase 2

Develop Concept

- Workshops.
- Focus groups

Phase 3

Explore requirements

- Concept Review
- Think aloud

Phase 4

Refine

- Home trials
- Iterative Development

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Developing the concept

As many as 10 variations of screen designs are proposed in group design meetings.

Allows all stakeholders to understand interaction, flow and features.

Designed using standard design patterns.

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Interface Development

Human Computer Interaction interview techniques were used to establish:
-**Requirements:** e.g. visual supports, button size, language
-**Interaction:** e.g. text entry, input methods
-**Layout:** e.g. affordance, orientation, position of buttons

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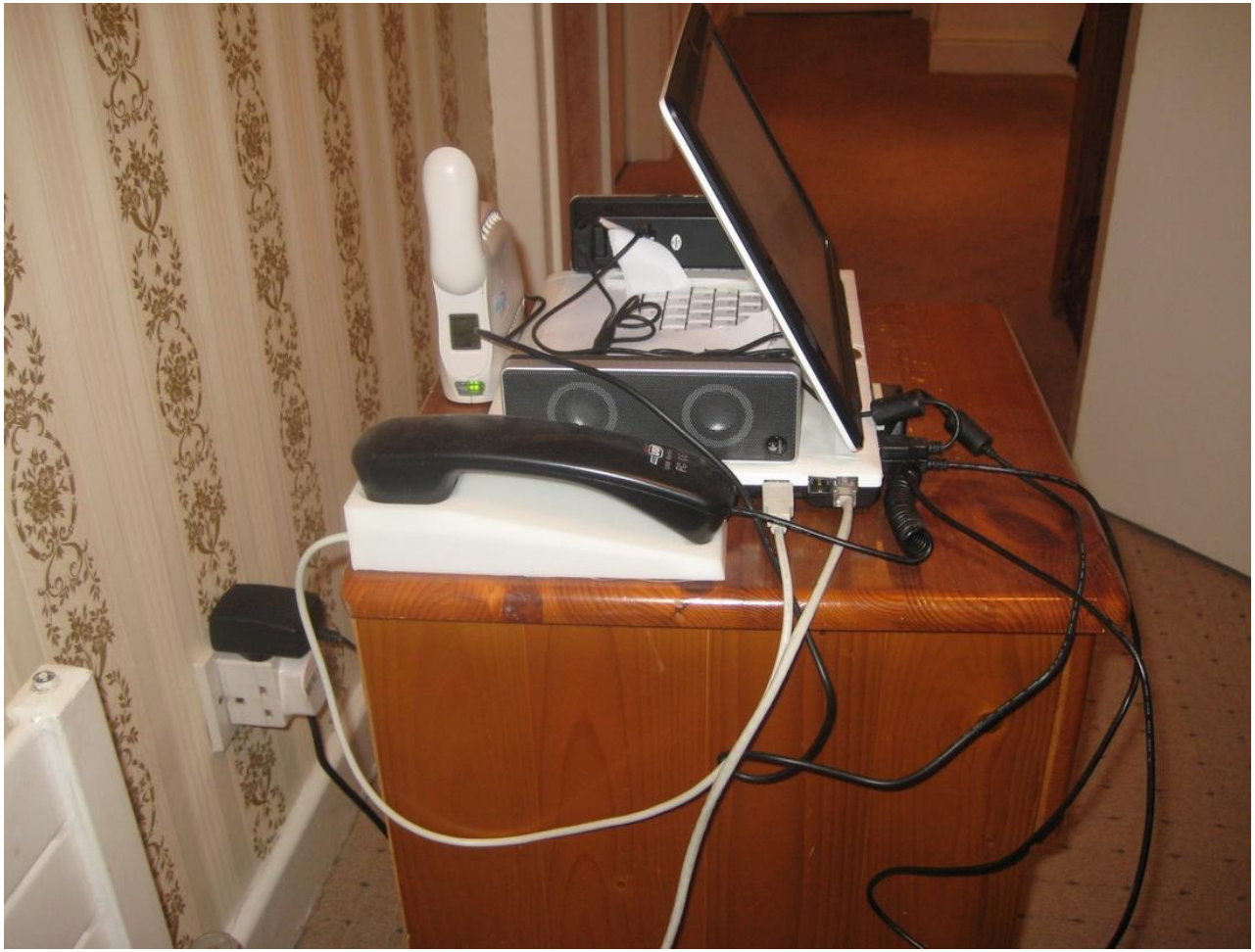
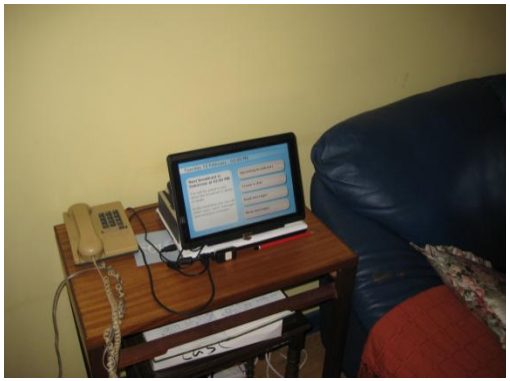
Early prototype in the home





1st iteration of hardware design.

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Better Hardware, Better usage

Cleaner Product Identity.

More suited for deployment.

Friendlier Aesthetic.

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Summary

User-Centred Design approach very much applicable in designing technologies for Intellectual Disability:

- Ethnography
- Storyboarding
- Prototyping
- Workshop/User Forums
- In-home technology deployments

User involvement is critical in designing technologies – you cannot simulate the experience or assume needs for users

Create an early solution and work with users to refine and develop it further – don't try to develop final solution in one cycle

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